



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,991	04/20/2005	Mitsuo Inoue	403373	5998

23548 7590 07/07/2006  
LEYDIG VOIT & MAYER, LTD  
700 THIRTEENTH ST. NW  
SUITE 300  
WASHINGTON, DC 20005-3960

EXAMINER

BOOTH, RICHARD A

ART UNIT PAPER NUMBER

2812

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/531,991

**Applicant(s)**

INOUE ET AL.

**Examiner**

Richard A. Booth

**Art Unit**

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 5-9 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 5-9 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al., U.S. Patent 6,566,683 in view of Ong, U.S. Patent 5,880,041.

Ogawa et al. shows the invention substantially as claimed including a semiconductor device fabricating method comprising: an amorphous silicon laminating process for forming an amorphous silicon film on a substrate; an irradiation process for irradiating said amorphous silicon film with laser light to transform at least a part of said amorphous silicon film into a polycrystalline silicon film; wherein said laser light is a linear beam having an energy-density gradient as claimed in the widthwise direction, and said linear beam is generated by transforming pulse laser light with a wavelength in a range between 350 nm or more and 800 nm or less (see, for example, col. 5-lines 12-21 and col. 7-line 57 to col. 10-line 23).

Ogawa et al. does not expressly disclose an oxidation process for oxidizing the surface of said polycrystalline silicon film in an atmosphere including oxygen after the irradiation process, said oxidation process performed in an atmosphere of saturated water vapor under a pressure of 10 atmospheric pressures or more and at a

temperature in a range between five hundred celsius or more and six hundred fifty celsius or less.

Ong discloses an oxidation process for oxidizing a surface of a substrate, said oxidation process performed in an atmosphere of saturated water vapor under a pressure of 10-25 atmospheric pressures and at a temperature in a range between six hundred to eleven fifty celsius (see col. 2-lines 48-67), wherein the process can be used for forming gate oxides (see col. 4-lines 42-43). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Ogawa et al. so as to form the gate insulation film of Ong in the primary reference of Ogawa et al. because such an oxide film can be formed in a rapid manner.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al., U.S. Patent 6,566,683 in view of Ong, U.S. Patent 5,880,041 as applied to claims 5 and 7-8 above, and further in view of Clementi et al., U.S. Patent 6,248,630.

Ogawa et al. and Ong are applied as above but do not expressly disclose further laminating silicon oxide by a chemical vapor deposition process on the oxidized surface of the polysilicon film.

Clementi et al. discloses a gate insulator formed of a thermally oxidized film 10 and a chemical vapor deposited film 9 (see figs. 1a-1c and col. 6-lines 5-61). With respect to the particular order of processing the cvd and thermally oxidized films, the selection of any order of performing process steps is prima facie obvious in the absence

of new or unexpected results (see *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946)). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Ogawa et al. modified by Ong so as to include a gate oxide as taught by Clementi et al. because such a gate oxide film will have less defects since the thermally oxidized portion of the film is abutting the substrate.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al., U.S. Patent 6,566,683 in view of Ong, U.S. Patent 5,880,041 as applied to claims 5 and 7-8 above, and further in view of Codama, U.S. Patent 5,292,675.

Ogawa et al. and Ong are applied as above but do not expressly disclose before oxidizing said polycrystalline silicon film, patterning said polycrystalline silicon film on said substrate so that said polycrystalline silicon film has side surfaces, wherein, in oxidizing said polycrystalline silicon film, the side surfaces of said polycrystalline silicon film are covered by said oxide film.

Codama discloses before oxidizing said polycrystalline silicon film 2, patterning said polycrystalline silicon film on said substrate so that said polycrystalline silicon film has side surfaces, wherein, in oxidizing said polycrystalline silicon film, the side surfaces of said polycrystalline silicon film are covered by said oxide film 7 (see figs. 1A-1D and col. 3-line 21 to col. 4-line 47). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Ogawa et al. modified by Ong so as to form the oxide film as shown by

Codama because in such a way the polycrystalline silicon film will be protected on all sides from any implantation damage.

### ***Response to Arguments***

Applicant's arguments with respect to claims 5-9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

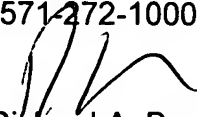
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is (571) 272-1668. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Richard A. Booth  
Primary Examiner  
Art Unit 2812

June 30, 2006